

**Amendments to the CLAIMS:**

Without prejudice, this listing of the claims replaces all prior versions and listings of the claims in the present application:

**LISTING OF CLAIMS:**

1. (Currently Amended) A sensor element, comprising:

a measurement area;

a lead wire area;

a measurement device arranged in the measurement area; and

at least one lead wire having a first electric resistance to the measurement device and being provided in the lead wire area, wherein:

the first electric resistance has a positive temperature coefficient in at least some areas,

the lead wire area has at least one second electric resistance that has a negative temperature coefficient,

at least the first electric resistance, the at least one second electric resistance, and a third electric resistance of the measurement device form a total resistance,

[[and]]

the positive temperature coefficient and the negative temperature coefficient are ~~coordinated so~~ such that the total resistance remains at least approximately constant when there is a change in a temperature distribution in the lead wire area,

the measurement device includes a first electrode and a second electrode in the measurement area of the sensor element and a solid electrolyte arranged between the first electrode and the second electrode,

a first lead wire of the at least one lead wire leads to the first electrode,

a second lead wire of the at least one lead wire leads to the second electrode,

the first lead wire and the second lead wire are arranged in the lead wire area,

the solid electrolyte is arranged between the first lead wire and the second lead wire,

the first lead wire and the second lead wire include in at least some areas

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

thereof a cermet containing  $Al_2O_3$  as a ceramic component and containing platinum and palladium as metallic components, and  
a palladium content is 2 to 50 percent by weight based on the metallic components of the cermet.

2. (Original) The sensor element according to claim 1, wherein:

the sensor element is disposed in a gas sensor for determining a physical quantity of a gas component in an exhaust gas of an internal combustion engine.

3. (Canceled).

4. (Currently Amended) The sensor element according to claim ~~[[3]]~~ 1, wherein:

the first electric resistance having the positive temperature coefficient is formed by resistances of the first lead wire and the second lead wire,

the at least one second electric resistance having the negative temperature coefficient corresponds to a resistance of the solid electrolyte body between the first lead wire and the second lead wire, and

a resistance of the first electrode, a resistance of the second electrode, and the resistance of the solid electrolyte in the measurement area enter into the third resistance.

5. (Currently Amended) The sensor element according to claim 1, wherein:

the sensor element is secured in a heated housing, ~~and~~

~~the change in the temperature distribution in the lead wire area can be attributed to a heating of the housing.~~

6. (Currently Amended) The sensor element according to claim ~~[[3]]~~ 1, wherein:

in a portion of the lead wire area that is subject to a greatest heating, a section of the first lead wire and a section of the second lead wire having a higher resistance in comparison with a resistance of the first lead wire and a resistance of the second

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

lead wire outside the sections of the first lead wire and the second lead wire are provided.

7. (Original) The sensor element according to claim 1, further comprising:

a heating element that heats up the sensor element in the measurement area to a predetermined temperature and enters into a regulation of the total resistance.

8. (Currently Amended) The sensor element according to claim ~~[[3]]~~ 1, wherein:

the total resistance is ~~determined by applying an a.c. voltage~~ between the first lead wire and the second lead wire, ~~and~~

~~a total a.c. voltage resistance is determined by an electronic measurement device arranged outside the sensor element.~~

9. (Original) The sensor element according to claim 7, wherein:

the predetermined temperature in the measurement area remains at least largely constant when there is the change in the temperature distribution because of an external influence acting on the lead wire area.

10. (Currently Amended) The sensor element according to claim ~~[[3]]~~ 1, wherein:

the first electrode, the second electrode, and the solid electrolyte form an electrochemical cell,

the first electrode is a Nernst electrode arranged in a measurement gas space,  
and

the second electrode is a reference electrode arranged in a reference gas space.

11. (Original) The sensor element according to claim 10, wherein:

the electrochemical cell includes a Nernst cell of one of a broadband probe and a lambda probe.

12. (Canceled).

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

13. (Currently Amended) The sensor element according to claim ~~[[12]]~~ 1, wherein:

the palladium content is 10 percent by weight.

14. (New) A sensor element for a gas sensor and for determining a physical quantity of a gas component in an exhaust gas of an internal combustion engine, comprising:

a measurement area;

a lead wire area, wherein:

at least one lead wire having a first electrical resistance to a measurement device arranged in the measurement area is provided in the lead wire area of the sensor element,

the first electrical resistance has a positive temperature coefficient in at least some areas,

the lead wire area has at least one second electrical resistance having a negative temperature coefficient, and

at least the first resistance, the second resistance, and a third resistance of the measurement device forming a total resistance,

the temperature coefficients of the first and second resistances are such that the total resistance remains at least approximately constant when there is a change in the temperature distribution in the lead wire area of the sensor element, and with rising temperature in the lead wire area, a reduction in the second resistance is offset by an increase in the first resistance resulting from the temperature increase in the lead wire area.

15. (New) The sensor element according to claim 14, wherein:

the sensor element is disposed in the gas sensor for determining the physical quantity of the gas component in the exhaust gas of the internal combustion engine.

16. (New) The sensor element according to claim 14, wherein:

the measurement device includes a first electrode and a second electrode in the measurement area of the sensor element and a solid electrolyte arranged

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

between the first electrode and the second electrode,  
a first lead wire of the at least one lead wire leads to the first electrode,  
a second lead wire of the at least one lead wire leads to the second electrode,  
the first lead wire and the second lead wire are arranged in the lead wire area,  
and  
the solid electrolyte is arranged between the first lead wire and the second lead wire.

17. (New) The sensor element according to claim 16, wherein:

the first electric resistance having the positive temperature coefficient is formed by resistances of the first lead wire and the second lead wire,  
the at least one second electric resistance having the negative temperature coefficient corresponds to a resistance of the solid electrolyte body between the first lead wire and the second lead wire, and  
a resistance of the first electrode, a resistance of the second electrode, and the resistance of the solid electrolyte in the measurement area enter into the third resistance.

18. (New) The sensor element according to claim 14, wherein:

the sensor element is secured in a heated housing.

19. (New) The sensor element according to claim 16, wherein:

in a portion of the lead wire area that is subject to a greatest heating, a section of the first lead wire and a section of the second lead wire having a higher resistance in comparison with a resistance of the first lead wire and a resistance of the second lead wire outside the sections of the first lead wire and the second lead wire are provided.

20. (New) The sensor element according to claim 14, further comprising:

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

a heating element that heats up the sensor element in the measurement area to a predetermined temperature and enters into a regulation of the total resistance.

21. (New) The sensor element according to claim 16, wherein:

the total resistance is between the first  
lead wire and the second lead wire.

22. (New) The sensor element according to claim 20, wherein:

the predetermined temperature in the measurement area remains at least  
largely constant when there is the change in the temperature distribution because of an  
external influence acting on the lead wire area.

23. (New) The sensor element according to claim 16, wherein:

the first electrode, the second electrode, and the solid electrolyte form an  
electrochemical cell,  
the first electrode is a Nernst electrode arranged in a measurement gas space,  
and  
the second electrode is a reference electrode arranged in a reference gas space.

24. (New) The sensor element according to claim 23, wherein:

the electrochemical cell includes a Nernst cell of one of a broadband probe and  
a lambda probe.

25. (New) The sensor element according to claim 16, wherein:

the first lead wire and the second lead wire include in at least some areas  
thereof a cermet containing  $\text{Al}_2\text{O}_3$  as a ceramic component and containing platinum  
and palladium as metallic components, and  
a palladium content is 2 to 50 percent by weight based on the metallic  
components of the cermet.

**Appl. No. 10/045,710**  
**Att. Docket No. 10191/2143**  
**Response To Office Action of 11/24/03**

26. (New) The sensor element according to claim 25, wherein:  
the palladium content is 10 percent by weight.

27. (New) The sensor element according to claim 14, wherein the temperature coefficients of the first and second resistances are coordinated so that the total resistance remains at least approximately constant.